UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/538,700	03/30/2000	Stephen J Sicola	P00-2938	8704

7590   02/24/2003

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EXAMINER
DUNCAN, MARC M

ART UNIT	PAPER NUMBER
2184	

DATE MAILED: 02/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

		Application No.	Applicant(s)
Office Action Summary		09/538,700	SICOLA ET AL.
		Examiner	Art Unit
		Marc M Duncan	2184

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 March 2000* .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 March 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

     If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some *   c)☐ None of:

         1.☐ Certified copies of the priority documents have been received.

         2.☐ Certified copies of the priority documents have been received in Application No. _____ .

         3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

     a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3* .	6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Yanai et

al.

Referring to claim 1:

Yanai teaches storing, on a log unit in primary cache memory in the first array

controller, the data and associated command for every write transaction that occurs

between the host computer and the local array, wherein the primary cache is mirrored in

backup cache memory in the second array controller (Fig. 1, col. 7 lines 7-11).

Yanai also teaches sending the data to a remote storage system to create a

remote copy (col. 7 lines 7-11).

Yanai further teaches, in case of failure, the method of reading the data from the

backup cache for each transaction in the log unit and writing the data to the remote

storage system in transaction order (col. 7 lines 62-64 and col. 8 lines 33-35).

Referring to claim 2:

Yanai teaches the step of sending the host computer a write completion status

message prior to sending the data to the remote storage system (col. 6 lines 26-32).

Referring to claim 3:

Yanai teaches the writing step including performing transaction order merging of the data on the log unit with the data previously stored on the remote storage system to return the data on the local storage system and the remote storage system to a consistent data state (col. 8 lines 33-35).

Referring to claim 4:

Yanai teaches continuing to write the data from the host computer to the log unit while the merging is being performed (col. 8 lines 24-25 and lines 31-35, col. 6 lines 28-28 "asynchronously").

Referring to claim 5:

Yanai teaches the log unit comprising a storage set considered as a logical unit by the array controller (Fig. 1 and col. 7 lines 9-11).

Referring to claim 6:

Yanai teaches the data written by the host computer being stored in cache memory in the first array controller in transaction order (Fig. 2 and col. 7 lines 7-11).

Referring to claim 7:

Yanai teaches the second array controller communicating with the first array controller to determine when the first array controller fails (Fig. 1 and col. 8 lines 21-24).

Referring to claim 8:

Yanai teaches the data written by the host computer being written in asynchronous mode (col. 6 lines 25-31).

Referring to claim 9:

Yanai teach the remote storage system being unavailable due to a situation

wherein either the at least one link has failed, the remote site is down or a site failover

has occurred (col. 5 lines 6-10 and col. 8 lines 21-24).

Referring to claim 10:

Yanai teaches storing the data for each write transaction from the host computer

in mirrored cache memory in both the first array controller and the second array

controller (Fig. 1, col. 7 lines 7-11), storing command information including the LBN

extent associated with the data in a log in mirrored cache memory in both the first array

controller and the second array controller (Fig. 1, col. 7 lines 7-11), sending a write

completion status to the host (col. 6 lines 26-32) and sending the data to the remote

system (col. 6 lines 26-32), wherein, if the first controller fails before the data is

successfully copied to the remote storage system, merging the data, stored on the log,

with the backup copy in the remote storage system, in response to commands issued

by the second array controller, by using the command information stored in the log to

write the data associated therewith to the remote data storage system in the order in

which each said write transaction originally occurred (Fig. 2 and col. 7 lines 7-11 and

62-62, col. 8 lines 33-35).

Referring to claim 11:

Yanai teaches merging the data, stored on the log, with the backup copy in the

remote storage system, in response to commands issued by the first array controller, by

using the command information stored in the log to write the data associated therewith

to the remote data storage system in the order in which each said write transaction

originally occurred (Fig. 2 and col. 7 lines 7-11 and 62-62, col. 8 lines 33-35).

Referring to claim 12:

Yanai teaches the second array controller communicating with the first array

controller to determine when the first array controller fails (Fig. 1 and col. 8 lines 21-24).

Referring to claim 13:

Yanai teaches the data written by the host computer being written in

asynchronous mode (col. 6 lines 25-31).

Referring to claim 14:

Yanai teaches the data written by the host computer being stored in cache

memory in the first array controller in transaction order (Fig. 2 and col. 7 lines 7-11).

Conclusion

The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. The prior art not relied upon contains elements of the instant

claims and/or represents a current state of the art.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Marc M Duncan whose telephone number is 703-305-

4622. The examiner can normally be reached on M-T and TH-F 6:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Robert Beausoliel can be reached on 703-305-9713. The fax phone

numbers for the organization where this application or proceeding is assigned are 703-

746-7239 for regular communications and 703-746-7238 for After Final

communications.

     Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is 703-305-

3900.

md
February 13, 2003

ROBERT BEAUSOLIEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100